Electron Hydro Diversion Repair and Spillway Replacement Project
Water Quality Monitoring Plan
Winter Stabilization Version

Prepared by:

19318 Electron Rd. E.
Orting, Washington 98360

September 19, 2020

Rev.	Date	
1	8/26/20	Added questions and answers on Pages 9 and 10 for clarity.
2	8/26/20	Figure 1, Page 11 shows new #4 Outfall Sample Point location.
3	8/27/20	Figure 2, Page 12 shows check dams at the Outfall Channel.
4	8/28/20	Text to eliminate Sediment Pond, and treat water by Forested Uplands discharge and infiltration, and Revised Figures 1 and 2.
5	8/30/20	Clarify text and Revised Figure 1 with new note.
5WSV	9/19/20	Added items for Winter Stabilization work (in blue).

Electron Hydro Diversion Repair and Spillway Replacement Project
Water Quality Monitoring Plan
Winter Stabilization Version

INTRODUCTION AND BACKGROUND

Electron Hydro is currently performing the Electron Hydro Diversion Repair and Spillway Replacement Project. The project is located on the Puyallup River approximately 18 miles upstream of Orting, Washington. The headworks at the construction project location includes a flow diversion structure, spillway, and diversion channel with flow controls leading to a 10-mile long wooden box flume that conveys diverted water to the powerhouse for electricity generation. In its pre-project condition, the diversion entrains fish along with diverted flows, and those fish travel 10-miles down the flume to a forebay pond where they are trapped and hauled and released back to the Puyallup River. The diversion repair and spillway replacement project is an essential step to allow installation and operation of a modern fish screening system at the intake to exclude fish from being entrained. The project will greatly reduce the impacts to fish resulting from entrainment into water intake, transport down the fume, and fish handling during the current trap and haul operation. In-water construction activities started in 2019 with bank stabilization upstream and downstream of the diversion. The bulk of in-water work to repair the diversion and replace the spillway is ongoing from July through September 2020. Fish exclusion work is scheduled to be completed in 2021. This water quality monitoring plan (WQMP) guides compliance monitoring for stormwater and dewatering water generated during the in-water construction activities. *This Winter Stabilization Version adds a few temporary items to stabilize the worksite during the winter of 2020 (see Figure 3 plan attached). The time period for this version is between today and the first two weeks of November, weather dependent, and as agencies approve.*

PURPOSE

The purpose of the WQMP is to provide specifics on water quality sampling for turbidity and pH, as well as track the performance of Best Management Practices (BMPs) used during in-water work, as described in this document. This WQMP identifies the appropriate parameters to be monitored, includes a monitoring schedule, monitoring locations, monitoring and sampling procedures, and contingency sampling procedures.

OBJECTIVES

- Provide specific locations and methods for sampling water quality for turbidity and pH.
- Document the performance of BMPs used within waters that the proposed work will occur in by monitoring water quality.
- Determine if State water quality standards are being met at two points-of-compliance: at Sample Point #2 and Sample Point #3 (see **Figure 1**).

There will be additional sampling at Pump #3 inlet.

Any changes in the proposed monitoring will be submitted to Ecology and the Corps of Engineers for approval prior to making the changes. Any revisions to the WQMP will be subject to review and approval by Ecology under the Construction Stormwater General Permit (CSWGP) and the Corps of Engineers under the Section 404 Nationwide Permits #3 and #13 for work within Waters of the U.S.

DESCRIPTION OF IN-WATER/OVER-WATER CONSTRUCTION ACTIVITIES

The Electron Hydro Diversion Repair and Spillway Replacement Project includes the removal of the damaged wooden diversion structure, installation of a concrete foundation and inflatable bladder spillway and supporting infrastructure, reconfiguration of the water intake channel, and targeted stabilization of the riverbed and riverbanks. This phase of construction lays the groundwork for the next phase in which fish screens will be installed to prevent the entrainment of fish into the water intake. Work within the OHWM includes:

- Bank stabilization upstream and downstream of the diversion (completed in 2018 and 2019)
- Installation of a temporary cofferdam to isolate the in-river work area from river flows
- Construction of a temporary bypass channel to route river water downstream of the in-river work area
- Excavation within the isolated work area to a target elevation below the riverbed (depth varies)
- Temporary dewatering of the excavation
- Concrete construction of the replacement spillway and supporting infrastructure
- Installation of an inflatable rubber bladder as a flow control structure in the spillway
- Stabilization of the riverbed
- Removal of the temporary bypass channel and temporary cofferdam
- Restoration of river flow through the new spillway structure
- Work activity items for Winter Stabilization are shown on the attached **Figure 3**, items not crossed out, and as allowed by the agencies.

Work in the upland includes:

- Construction staging area (equipment, fuel, stockpiles)
- Temporary concrete batch plant and concrete washout area (contained)
- Operation and maintenance of the on-site water quality treatment system

The construction work includes activities that will generate turbid water and may affect the pH of the water within the isolated work area. Concrete stairs will be poured (and no pH laden water will reach waters of the state) from the road along the river to the staging area. Stormwater and dewatering water pumped out of the excavation will be routed through the on-site water treatment system.

WATER QUALITY STANDARDS FOR SURFACE WATERS

The project is located in WRIA (Water Resources Inventory Area) 10 (Puyallup/White), in the Puyallup River. The Puyallup River is designated as Core Salmonid Summer Habitat use in the vicinity of the construction site, which requires monitoring the following parameters.

- **Turbidity:** Shall not exceed 5 NTU over background when the background is 50 NTU or less; or 10 percent increase in turbidity when the background turbidity is more than 50 NTU: as outlined in Washington Administrative Code (WAC) 173-201A-200(1)(e) for Core Salmonid Summer Habitat.
- **pH:** pH shall be within the range of 6.5 to 8.5. pH will be monitored using a pH meter. If any water enters the containment area behind the cofferdam when cementitious work is occurring, pH will be monitored using a pH meter. All pH data will be recorded on the field monitoring forms. Best Management Practices will be employed to ensure all water leaving the containment area meets State water quality requirements prior to discharge.
- **Oil and Grease**: No visible sheen. Inspect vehicles and equipment daily, and prior to entering the area below ordinary high water.

The Nationwide Permit Authorization issued by the Corps of Engineers included an Endangered Species Act (ESA) Section 7 consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). The consultation yielded Biological Opinions (BO) issued by each agency in July 2018. Turbidity will be monitored in accordance with the Terms and Conditions set in the USFWS BO. Electron Hydro will also fully comply with implementing all reasonable and prudent measures outlined in the National Marine Fisheries Service (NMFS) BO. These criteria set in the BOs also satisfy the criteria set by the CSWGP, permitted by the Washington Department of Ecology (Ecology) in July 2018. The results of monitoring efforts will be transmitted weekly to the US Army Corps of Engineers and Ecology.

MONITORING PLAN

Monitoring Contacts

Electron Hydro staff Chris Spens and Corey Kleppe will be responsible for providing Ecology with the necessary notifications and results of the water quality monitoring per the frequency specified in the CSWGP and the Section 401 WQC. The monitoring team will include Electron Hydro staff led by Chris Spens. Contact information is provided below:

Chris Spens:	(360) 746-3435
Corey Kleppe	253-655-3039
Mallory Voyk:	(425) 923-5021
Corey Alefteras	360-688-0080

Monitoring Schedule

Turbidity monitoring will be conducted daily (visual monitoring will occur downstream at Pump #3 inlet while active excavation is occurring) and reported weekly. Visual monitoring will occur

along the riverside edge of the Forested Uplands infiltration area when water is being pumped to that area for infiltration. The visual monitoring will focus on confirming that no water is flowing overland from that area into the river. More frequent contingency monitoring related to specific events (e.g. start of sediment-generating activities, exceedance events, etc.) is described below under Sampling Procedures. Monitoring of pH will be conducted daily and reported weekly while construction activities using cement are ongoing. All concrete related work below OHWM will be performed within the in-river work area that is isolated from river flows by a temporary coffer dam. No pH sample points are located within the river. Instead, water in contact with concrete work will be sampled within the excavation at pump locations and tested for pH to determine if water treatment is required. If the water requires treatment to adjust pH within the acceptable range, it will be treated by injecting CO_2 into the pump discharge line so it will be vigorously mixed with the water as it flows through the line. Water exiting the discharge line will be tested to determine whether it is in compliance with the pH standard. The injection rate will be adjusted until the water is in compliance. Treated water will be pumped to the Conveyance Ditch, Sediment Trap, then pumped into a Forested Uplands area (shown on **Figure 2**) where it will be discharged through a manifold to distribute the water for infiltration. As a backup option, a temporary water treatment tank will be maintained on site for isolated treatment using either CO_2 sparging or dry ice. Water within the tank will be tested for pH and will be sampled prior to discharge. Treated water will be pumped to the Conveyance Ditch, Sediment Trap, then pumped into the Forested Uplands area for infiltration. Water that does not require treatment and meets requirements for turbidity will be discharged into the Conveyance Channel. Monitoring and testing results will be documented in the weekly reports and provided to the Corps and Ecology.

Monitoring Duration

Water samples will be collected, and visual observations will be recorded for as long as work activities below the OHWM continue. Visual monitoring for turbidity and sheen will be conducted continuously for those times when construction activities could potentially impact water quality. The on-site monitor will generally be stationed downstream of active excavation on the left bank of the river. This location will allow the monitor to observe both the river flow conditions and monitor the riverside edge of the Forested Uplands area where treated water is infiltrated (**Figure 2**). For Winter Stabilization work, all excavations in live water (all water that reaches waters of the state, including water currently in the excavation area) require visual monitoring 300 feet downstream of any activity (monitoring personnel must be stationed 300 feet downstream during all in-water work). If multiple activities are occurring, the monitoring will occur at 300 feet downstream of the most downstream activity. This includes placement of large rock in the live water. Monitoring will occur continuously every day, while in-water work is being conducted. If an exceedance of 10% of background occurs at the 300' point of compliance, the monitoring personnel will report the exceedance to Ecology (see below specifics). If exceedances persist, in-water activities may need to be adaptively modified with BMPs to minimize water quality impacts.

Monitoring of pH will occur when construction activities that involve cement/concrete are occurring at the in-water construction site. Concrete construction activities will be conducted within a dewatered work area isolated from Puyallup River flows by a temporary cofferdam and temporary bypass channel. Treated water from the excavation dewatering operation will be tested for pH prior to release into the Conveyance Ditch.

Non-Compliance

If either visual or physical monitoring indicates that water quality standards (turbidity and pH) have been exceeded, the required reporting will be initiated.

SAMPLING PROTOCOL

Sampling Locations

Monitoring locations are identified on **Figure 1** for construction activities within OHWM. There are three monitoring locations (in addition to the monitoring for pH in the excavation zone) identified as follows:

Sample Point #1: Upstream Sample Point – the upstream sample point is located approximately 1,500 ft upstream of the limits of excavation within OHWM. The upstream sample point provides the background sample.

Sample Point #2: Downstream Sample Point – The stream gage (rock gage) sample point is the point of water quality compliance identified in the Corps Section 404 permit. Per the Corps permit requirements, it is located approximately 1,500 ft downstream of the limits of excavation within OHWM.

Sample Point #3: Channel Sample Point – The Channel Sample Point is a sample location at the end of the Conveyance Channel just prior to water entering the river (additional sampling will occur in the construction area).

Sampling Procedures

Turbidity Monitoring

An appropriately trained and knowledgeable Electron Hydro staff member will be available during every day of in-water construction activity to take and report turbidity measurements, who will work under the direction of a CESCL. The turbidity assessment protocol is as follows:

1. Sample 2 locations (Sample Points #1 and #2, **Figure 1**) daily, at the intervals specified by Corps permit, which incorporates NMFS and USFWS Biological Opinions. The NMFS and USFWS BOs stipulate that work will cease and sediment control procedures will be re-evaluated if:
    - background turbidity is exceeded by 56 NTU at any time,
    - background turbidity is exceeded by 37 NTU for more than a cumulative hour during a 10-hour workday,

- background turbidity is exceeded by 13 NTU for more than a cumulative 3 hours in a 10-hour workday,
- background NTU levels are exceeded by 8 NTU for more than 7 hours over a 10-hour workday.

These compliance criteria are different compared to the State compliance criteria for turbidity, which stipulate turbidity limits of 5 NTU above background when background is less than 50 NTU and 10 percent or less above background when background turbidity is greater than 50 NTU.

2. One additional location (Sample Point #3) will be monitored when water accumulates at the end of the Conveyance Channel.

3. Monitor to establish background turbidity levels upstream of construction, and away from the influence of sediment-generating activities (Sample Point #1). Background turbidity will be monitored at least twice daily (early morning and early afternoon) during sediment-generating activities. For Winter Stabilization work, additional sampling may take place if the background turbidity changes during the construction day.

4. To monitor for construction-influenced changes in turbidity, turbidity monitoring will be conducted 1,500 feet downstream of in-water construction activities (Sampling Point #2) as stipulated in the Section 404 permit issued by the Corps of Engineers.

5. Determine the turbidity of each sample by testing with an EPA-approved NTU meter; turbidity meter will be calibrated correctly and documented on a spreadsheet prior to each sample period.

6. Compare the results for Sample Point #1 (background) to Sample Point #2 (in-water work compliance point) and Sample Point #3 to determine whether there is an exceedance.

7. Turbidity at Sample Points 2 and 3 will not exceed 10% above background NTU levels, in accordance with Washington Water Quality Standards. If turbidity levels approach 10% above background, activities causing the exceedance will cease and sediment control measures will be inspected and adjusted. The on-site Environmental Monitor will inspect the riverside edge of the Forested Uplands area for infiltrating treated water to determine if surface flow is draining from that area directly into the river. If that is the case, the discharge manifold will be adjusted, relocated within the area, or stopped to allow excess surface water to infiltrate.

8. Ecology requirements specified in the CSWGP allow for modifications to the SWPPP, based on adaptive management.

9. Initiate response and reporting protocols if there is an exceedance.

In addition to the regular ongoing sampling and monitoring activities, there are specific protocols for the start of sediment-generating activities. Those protocols are outlined below:

Monitoring Protocols for Start of Sediment-Generating Activities

1. For the first 3 hours from the start of sediment-generating activities, monitoring will be conducted at 30-minute intervals. A person will generally be stationed 300 feet below sediment-generating activities along the left bank of the river. For Winter Stabilization work, when the river is re-diverted to the left bank, 300 feet downstream of the end of the in-river Conveyance Channel. Monitoring personnel will be safely stationed along the left bank 300' downstream of #3 Conveyance Channel Sample Point when the river re-enters the left side of the river channel. Additional monitoring will be 300 feet downstream of any work that has potential to create a turbid discharge.

2. If turbidity does not exceed the below-listed levels during the first hour of work, then monitoring will be reduced to once per hour.

3. If turbidity does not exceed the below-listed levels during the first 3 hours of work, then monitoring will be reduced to twice per day, until there is a change in excavation (depth or location within the excavation zone), then monitoring will begin again.

4. Per the conditions stipulated by the USFWS and NMFS BOs, work will cease and sediment control procedures will be re-evaluated if turbidity monitoring results exceed the compliance thresholds defined above based on State water quality standards or the turbidity standards stipulated by the USFWS and NMFS BOs.

pH Monitoring

Concrete pouring activities are planned to begin approximately August 26, 2020. During all concrete pouring activities, any water that comes into contact with concrete will be tested for pH. Should the water be outside the approved limits of 6.5 and 8.5 pH, it will be collected and pumped from the work area below OHWM. High pH water will be treated by injecting CO_2 into the pump discharge line allowing the CO_2 and water to mix vigorously within the discharge line downstream of the pump. Water exiting the discharge line will be tested to determine whether it is in compliance with the pH standard. The injection rate will be adjusted until the water is in compliance. Treated water will be discharged to the Conveyance Ditch where it will flow to the Sediment Trap on the uphill side of the flume. Water will be pumped from the Sediment Trap to the Forested Uplands area (shown on **Figure 2**) where it will be discharged through a manifold to distribute the water for infiltration. As a backup option, a temporary water storage tank (see **Figure 2** for location) will be maintained on site where water may be retained until its pH can be normalized by treatment using CO_2 sparging or dry ice. An adequate supply of these materials for pH treatment will be maintained on site during concrete construction activities below OHWM. Monitoring for pH and any pH adjustments will occur daily, in accordance with the CSWGP, to comply with 40 CFR § 450.21, "Prohibited discharges". Monitoring will be conducted with a digital pH meter and will be recorded in the monitoring logbook and included

in the weekly reports. The normalized water will be discharged to the Forested Uplands area for infiltration when pH is within approved pH limits. For Winter Stabilization work any activities that create pH laden water will be captured, sampled, and possibly treated according to treatment methods described in above detailed Monitoring Schedule section.

Monitoring of Intercepted Seepage Water

Water from the river flow seeps through the riverbed upstream of the excavation and flows into the excavation at multiple points on the upstream wall. That water is relatively clear compared to the typical natural background turbidity of the river because of natural filtration as it flows through sandy riverbed sediments. The dewatering plan includes a collection trench and a pump to collect that water before it contacts the active work areas within the excavation. This component of the dewatering plan prevents relatively clean water from mixing with highly turbid water in the bottom of the excavation. Visual observation of this seepage water indicates that it is much less turbid than adjacent river water. These observations will be verified by visual monitoring for turbidity. Provided the water complies with state water quality standards for turbidity it will be pumped back into the river through the Conveyance Channel shown on **Figure 2**.

CONTINGENCY PLAN FOR HIGHLY TURBID WATER:

Monitoring personnel will observe the riverside edge of the Forested Uplands infiltration area (see **Figure 2** for location) to ensure that infiltration occurs and ensure the water does not flow overland into the river. In the event that the Forested Uplands area becomes oversaturated and overwhelmed, treated water will be discharged to a secondary backup Forested Uplands area located adjacent to and downstream of the primary Forested Uplands area for infiltration. Turbid water will be infiltrated within the Forested Uplands area by discharging the water through a manifold that spreads out the water and dissipates flow energy and prevents soil erosion. Additional Backup Forested Wetlands is shown on **Figure 2**.

Additional contingencies include sampling for turbidity at unexpected locations as per CSWGP.

REPORTING

Exceedances of turbidity standards (sample results above 10% of background) will be called in as an Environmental Report Tracking System (ERTS) notification within 24-hours of acknowledgement at 360-407-6300 and the area inspector will also be notified.

The CSWGP requires monthly reporting of the highest values of water quality monitoring data (turbidity and pH), exceedances, and corrective measures as specified by the SWPPP and this WQMP. In addition to monthly reporting, Electron Hydro will prepare weekly reports describing construction activities and duration, confirmation of effective isolation of the in-river work area, dewatering system operation, turbidity monitoring activities and results, Field Turf containment and disposal, conservation measures implemented, and incidental takes associated with project activities. This is in accordance with implementing Reasonable and Prudent Measure 2 in the USFWS BO. Weekly reports will be submitted to the Corps of Engineers and Ecology.

In addition to regular weekly and monthly reporting, the following additional notifications are required by Ecology in response to exceedance events and changed conditions:

- High turbidity phone notification – within 24 hours.
- Non-compliance notification by phone – within 24 hours
- Non-compliance reports provide written notification – within 5 days of non-compliance (CSWGP condition S5F).

Additionally, phone and written notifications to Ecology will also be directed to:

Carol Serdar, Hydropower WQ Compliance Manager
(360) 742-9751
Cser461@ecy.wa.gov

For Winter Stabilization work, Ecology requests a daily site log for observations, including date, name of observer (printed and signature), statement certifying that the report is accurate and is true as witnessed by the monitoring personnel, and description of the activities performed over the day. The additional daily spreadsheet of turbidity observations (date, time, location along the river bank, and activity) that created turbid event at 300' monitoring location, and comments (color of turbid event, etc.), is included in this WQMP (see Figure 4).

Reporting process must include an Environmental Report Tracking System (ERTS) filing if turbidity or pH values exceed the WA Water Quality Standards as found in 173-201A WAC; reporting includes Ecology SWRO 360-407-6300 and email to carol.serder@ecy.wa.gov.

Responses to Corps Questions Re: Plan Submitted August 18, 2020

The Corps raised three specific questions about the plan prepared by Electron Hydro and submitted for Corps review on August 18, 2020. Responses are provided below.

"1. What happens when a storm or high flow event increases flow in the conveyance channel (page 7 of 20) to a rate that exceeds the pumping capacity of Pump 4? What happens when pump 4 fails? This occurrence is inevitable-what are the backups in place?"

Response: The new WQMP moves the Pump 4 location from the Conveyance Channel to the Sediment Trap. There will be a backup pump for Pump 4. Pump 4 will not be overwhelmed by high flows because it only manages water that was pumped into the Conveyance Ditch.

Only water that meets water quality standards of 110% NTU of background and pH between 6.5 and 8.5 can flow into the Conveyance Channel. Should the Conveyance Channel overtop, that is acceptable as it is essentially the river returning to the river. Water that could flow into the Conveyance Channel would be pumped by three other pumps (Pumps #1, #2, #3). Further backup pumps described below.

The new WQMP shows that there are three 6" pumps and one 3" pump. Electron Hydro will maintain a minimum of seven pumps (four 6" pumps and three 3" pumps) on-site to either

replace capacity for a failed pump or increase the available pump capacity for high flow conditions. The 6" pumps have a capacity of 2000 gpm. There currently is approximately 100 gpm running through the work area, and an additional 400 gpm below the work area.

The temporary bypass channel was designed to safely convey river flows up to 2000 cfs. That design flow was selected to exceed maximum anticipated river flows for July through September and prevent surface water in the river from spilling into the isolated in-river work area. Storms or high flow events would likely increase the rate of water flowing into the excavation either as stormwater runoff or shallow subsurface water flowing into the sides of the excavation. During higher flow conditions, the rate of water entering the excavation would be limited by the capacity of the subsurface flow paths and the surface area that drains to the excavation. The four pumps identified in the dewatering plan work together to remove water from the same excavation. Previous operation of one pump prior to the stop work order has demonstrated that it provided sufficient capacity to keep up with the rate of water flowing into the excavation.

"2. A trench near the position of well point 1 and perpendicular to the flow would provide greater lateral pickup and more effectively control groundwater into the site. What is the backup for pump 1 failure?"

Response: Pump 1 picks up water that enters the dried-up riverbed on the left bank. We agree that a trench near the position of the Pump 1 inlet and perpendicular to the river flow direction would provide greater lateral pickup. It would be at the risk of increasing the overall infiltration as the trench gets close to the flowing river. We will widen the intake area, moving toward the river to intercept any water traveling downslope toward the work area. The backup plan for Pump 1 failure is that we will maintain an additional backup pump for Pump #1 at the jobsite.

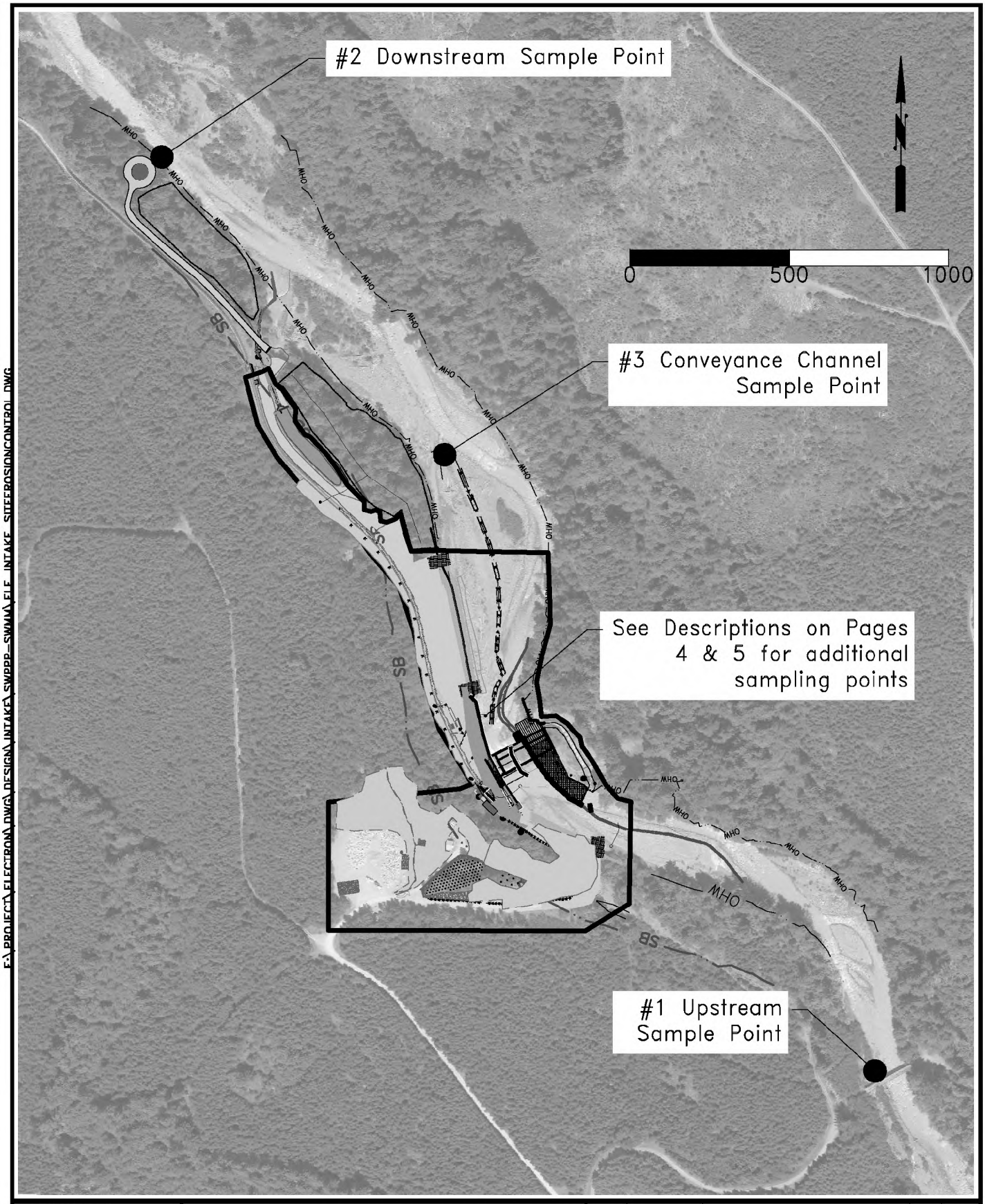
"3. The existence and operation of the Conveyance Channel depends entirely on river flows staying quite low-presumable under 1000-cfs. What is the plan should the channel be overtopped?"

Response:

It would take substantial flows in the bypass channel to overtop the lower cofferdam (downstream of the diversion) next to the Conveyance Channel. The bypass channel is designed for 2000 cfs. Sediment deposition resulting from the 10,000 cfs flood last February naturally raised the riverbed elevation of the dry cobble bar downstream of the diversion. As a result, the lower cofferdam is at a higher elevation than originally planned. However, should the river overtop the lower cofferdam and flow into the Conveyance Channel, there would be no environmental harm. This is due to our use of the Conveyance Channel as essentially just another branch of the river, and only water that meets water quality standards can flow into the Conveyance Channel.

The Conveyance Channel is intended to only pass water that meets water quality standards as it leaves the work area. It also is to facilitate infiltration of water that leaves the in-river excavation area by passive flow. This is expected to be at times when no concrete work is being performed, no excavation work, or no work such as at night. The Conveyance Channel dries up when

Pumps 2 and 3 are in operation. The Conveyance Channel will only be used if the water exiting the work area near Pump 3 is within 10% of background and within the required pH levels. Otherwise the water will be pumped into the treatment tanks or Conveyance Ditch. Water entering the Conveyance Channel will infiltrate at the north end or overtop and flow into the river. Overtopping would be acceptable since the water would meet water quality standards.



E:\PROJECTS\ELECTRON\DWG\DESIGN\INTAKE\SWPPP_SWMM.ELE_INTAKE_SITEEROSIONCONTROL.DWG

DRAWN: SPG	DIVERSION REPAIR, SPILLWAY REPLACEMENT AND BANK PROTECTION SWPPP SITE PLAN Sample Sites				
CHECKED: TAF					
DATE: 08/10/2020					
EXHIBIT 1 OF 2	PIERCE COUNTY Figure 1 WASHINGTON	1	8/31/20	Label update	SpG
		NO.	DATE	REVISION	BY CK

Figure 1

HORIZONTAL SCALE
200 0 200 400
FEET

Pump #3 Inlet
Pump #2 Discharge to Conveyance Ditch
Pump #3 Discharge into Conveyance Ditch or Treatment Tank
Treatment Tank
Pump #2 inlet.
Treatment Tank Discharge into Conveyance Ditch
Pump #1 inlet.
Conveyance Ditch
Conveyance Channel
Sediment Trap & #4 Pump Inlet
#4 Pump Outfall to Forested Uplands
Forested Uplands
Backup Forested Uplands
Pump #1 Discharge to River
Check Dams

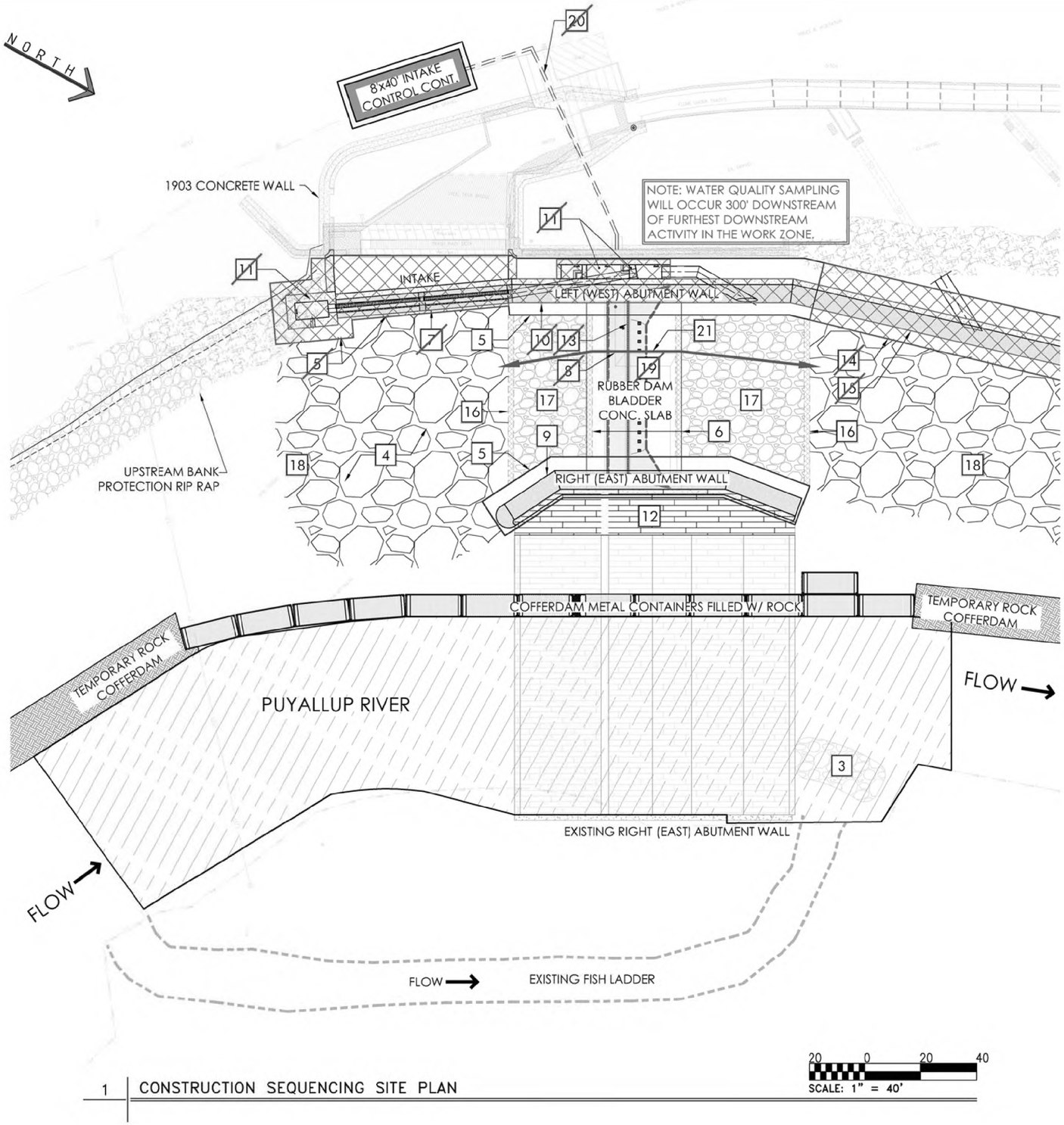
NO.	DATE	REVISION	BY	CK
9				
8				
7				
6				
5				
4				
3				
2				
1	8/29/2020	Revisions	SpG	TAF

Electron HYDRO EST. 1904

DIVERSION REPAIR, SPILLWAY REPLACEMENT AND BANK PROTECTION
WATER DIVERSION – RELOCATION PLAN
PIERCE COUNTY Figure 2 WASHINGTON

DESIGN: SpG
DRAWN: SpG
CHECKED: TAF
DATE: 8/15/2020
JOB#: 11011900
SHEET 2 OF 2
DRAWING 2

FILE NAME & LOCATION: E:\Project\ELECTRON\DWG\Design\Intake\ELE_DEWATER.dwg
DATE & TIME: August 29, 2020 15:34 PLOTTED BY: STEVEG



1 CONSTRUCTION SEQUENCING SITE PLAN

CONSTRUCTION SEQUENCING KEYNOTES

KEYNOTES ARE LISTED IN CONSTRUCTION SEQUENCING ORDER FROM NOTE 3

3 IMPROVING THE FISH LADDER PER THE FISH LADDER OPERATION AND MAINTENANCE PLAN

4 COMPLETE EXCAVATION AND DEWATERING EFFORTS PER THE MODIFIED WATER DIVERSION/RELOCATION PLAN

5 FORM AND POUR FOUNDATIONS FOR THE EAST ABUTMENT WALL THEN ~~INTAKE AND~~ WEST ABUTMENT WALL

6 FORM AND POUR THE TWO CENTER CUTOFF WALLS

~~7 FORM INTAKE WALL, PLACE AND ALIGN THE SLUICE PIPE~~

~~8 SET THE EMBED PIPES FOR THE BLADDER~~

9 FORM UP, PLACE EMBEDS, AND POUR THE EAST WALL

~~10 FORM UP, PLACE EMBEDS, AND POUR THE WEST WALL~~

~~11 FORM AND POUR THE TWO SLUICE PIPE VAULTS, AND THE MECHANICAL DRAIN EQUIPMENT VAULT~~

12 ONCE THE EAST ABUTMENT WALL IS POURED, CONNECT THE REMAINING EXISTING WOOD DIVERSION TO THE EAST ABUTMENT WALL

13 CONCURRENT TO THIS, FORM, ~~PLACE EMBEDS,~~ AND POUR REINFORCED SLAB BETWEEN THE TWO ABUTMENT WALLS

~~14 FORM AND POUR DOWNSTREAM ABUTMENT FOUNDATION~~

~~15 FORM AND POUR DOWNSTREAM ABUTMENT WALL SECTION~~

~~16 FORM AND POUR UPSTREAM AND DOWNSTREAM CUTOFF WALLS~~

~~17 POUR AND PLACE BOULDER ARMORING BETWEEN THESE TWO CUTOFF WALLS AND THE CENTER SLAB~~

18 PLACE LARGE RIP RAP DOWNSTREAM OF THE DOWNSTREAM OF THE LOWER CUTOFF WALL, AND UPSTREAM OF THE UPSTREAM CUTOFF WALL

~~19 CONCURRENT TO BUILDING CUTOFF WALLS AND BOULDER ARMORING, POSITION AND BOLT DOWN THE BLADDER ON THE CENTER SLAB~~

~~20 ONCE THE BLADDER IS IN PLACE, CONNECT THE AIR PIPING, DRAIN PIPING, AND BLOWERS BEFORE TESTING THE BLADDER OPERATIONS, TEST BLADDER OPERATIONS~~

21 PLACE LARGE ROCK IN LOCATION OF REMOVED WOOD DIVERSION TO ELEVATION 1620.00'

NO.	DATE	REVISION	BY	CK

Electron HYDRO EST 1904

PHASE 1 CONSTRUCTION SEQUENCING SITE PLAN

SCALE PER VIEW

DESIGN: RDM
DRAWN: ESK
CHECKED: TAF
DATE: 09-04-20
JOB#:

SHEET 1 OF 20

DRAWING
S0.1

Figure 3

EH0001453

DAILY TURBIDITY SAMPLING ACTIVITY SITE LOG

Electron Hydro Intake Project				Date:		
Weather:						
Location on River Bank:						
Work Activity Observed:						
Time:						
Upstream Sample Point #1:						
Downstream Sample Point #2:						
Exceedance (Y / N)						
Time:						
Sample Point #3:						
Exceedance (Y / N)						
Description of Turbity Event:						
Sample 300' Downstream						
Location	**Time**	**Turb. Color**	**NTU**	**Description of Work Performed**		
Observed by: (print)			(Signature)			
by my signature I certify that this report is accurate and true as witnessed.						